Quicker Than A Wink:

The Photographs of Harold Edgerton

The Whitney Museum of American Art
at Philip Morris is funded by
Philip Morris Companies Inc.

© 1997 Whitney Museum of American Art
945 Madison Avenue
New York, New York 10021

Quicker Than a Wink:
The Photographs
of Harold Edgerton

March 31–June 27, 1997

The exhibition was organized
by Eugenie Tsai
Essays by Angela Kramer Murphy and
Eugenie Tsai

Time Transfixed: Harold Edgerton's Artful Science

Harold Edgerton (1903-1990) may not be a household name, but many of the dramatic microseconds he captured on film—a drop of milk splashing into a cup, a bullet splitting a playing card in two, a hummingbird hovering in midflight, a tennis ball flattened by the strings of a racquet—are already icons in our repertory of cultural images. "Quicker Than a Wink: The Photographs of Harold Edgerton," presents a selection of eighty works from a recent gift by the estate of the artist to the Whitney Museum of American Art. This new addition to the Whitney's Permanent Collection spans Edgerton's entire career, from the 1930s through the 1980s. It includes a concentration of images from the thirties, an exciting and productive decade during which Edgerton invented the process of stroboscopic photography. This technological innovation revolutionized photography, allowing microseconds to be captured on film with great clarity, and resulted in arresting photographic images that have forever altered our view of ordinary events.

Like the nineteenth-century pioneers of photography, Edgerton approached the medium from the vantage of science. Raised in Aurora, Nebraska, he learned photography from an uncle, set up a darkroom in the family kitchen, and acquired a Kodak postcard folding camera. During the summers of his last years in high school, he worked at the Nebraska Power and Light Company, studying the company's huge generators. This experience was undoubtedly instrumental in his decision to pursue a career in the field of electrical engineering. In 1921, he enrolled at the University of Nebraska in Lincoln, where he received a BS in electrical engineering in 1925. Following his graduation, he worked for a year at the General Electric Company in Schenectady, New York, analyzing the performance of large rotating electrical motors. In 1926, he entered the Massachusetts Institute of Technology, receiving an MS in electrical engineering the following year and a doctorate five years later. Edgerton's student years at MIT marked the beginning of a professional association with the institution that was to last a lifetime. After his retirement as a professor in 1968, he continued to work in the MIT Stroboscopic Light Laboratory until his death in 1990.

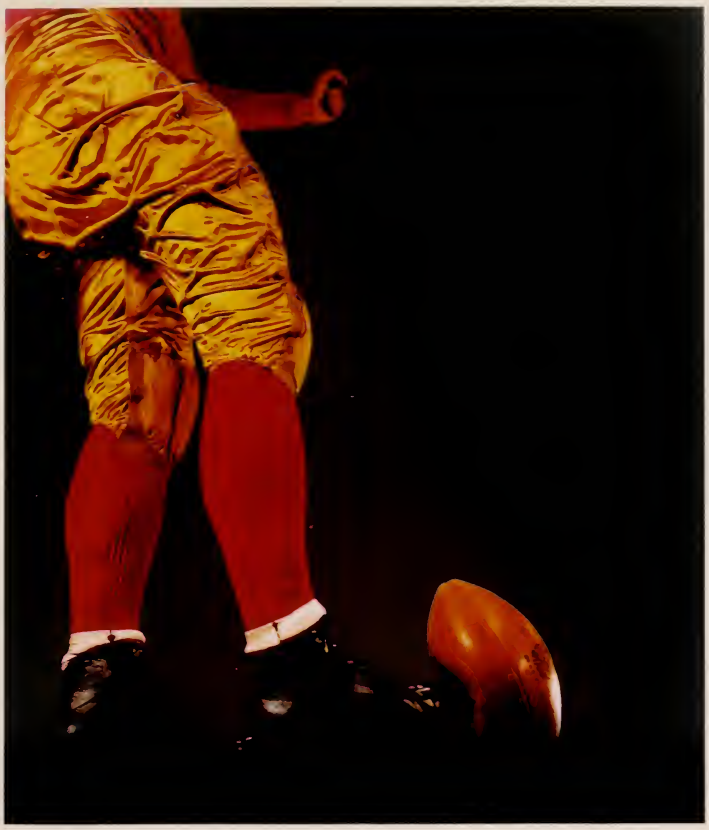
Edgerton's development of stroboscopic photography grew directly out of his graduate studies, in which he first used a stroboscope to study the whirling rotors of an engine. The stroboscope,

in which a moving object was viewed through a slotted disk or flashes of light, had been invented in 1832. Edgerton invented a process whereby the light flashed at the same speed as the engine, enabling him to "freeze" the movement of the rotors so that he could see it with clarity. The next step was to capture the frozen moment on film. In 1931, he developed and perfected the stroboscope for use in both ultra-high-speed and still, or stop-motion, photography by combining the device with a camera. This required the development of an extremely powerful, very fast, reusable flashlamp that could be timed to flash at intervals as infinitesimal as one-millionth of a second, thus overcoming the restrictions of a camera's mechanical shutter. We can see the results of Edgerton's invention in *Indian Club Demonstration* (1939), which juxtaposes two photographs, one taken with ordinary light and the other with his multiflash. The image on the left, an exposure illuminated by several seconds of light, shows the moving club as a blur of light. On the right, the image shot with Edgerton's high-speed light flashing at one hundred times per second clearly shows each microsecond of the sequence.

Two photographs of golfers demonstrate the ultra-high-speed and the still photographs made possible by Edgerton's stroboscopic technique. Shot at one hundred flashes per second, for half a second, *Dennie Shute* (1938) shows the figure of the golfer holding the club superimposed fifty times. We can chart the successive phases of the club throughout a single graceful stroke from start to finish. In *Iron, Golf* (1935), shot at one millionth of a second, we are able to see at close range a golf ball struck powerfully by a club and the actual compression of the ball that occurs at the moment of contact. Along with revealing realities beyond what the eye can perceive, these photographs also change our sense of time and space.

These two examples are part of a larger body of work showing humans in action—athletes, acrobats, and amateurs—that Edgerton began in the 1930s. Tennis (*Swirls and Eddies*, 1939), football (*Football Kick*, 1938), baseball (*Bent Bat Bumps Ball*, 1938), diving (*Diver Peter DesJardin*, 1940), archery (*Ouch!*, 1934), rope-skipping (*Jumping Girl*, 1940), baton-swirling (*Drum Majorette*, 1953), acrobatics (*Moscow Circus*, 1963), and fencing (*A Simple Salute*, 1938), are among the wide range of activities Edgerton photographed with great fascination and delight.

In 1940, Edgerton began to shoot sports events at the Boston Garden. His new process was dubbed "Speed-Ray" by sportswriters, who instantly recognized the significance of his invention. His devotion and dedication made him the feature of a *Believe It or Not* Ripley cartoon, in which he was depicted as the man closest to the Louis-Conn fight, but who didn't see it: "He sat directly under the ring within two feet of the contestants as he supervised operation of the ultra-column, high-speed light for I[nternational]



Harold Edgerton, *Football Kick*, 1938

Harold Edgerton, *Jumping Girl*, 1940

Harold Edgerton, *Mickey Rooney and Judy Garland at MGM Studios*, 1940

N[ews] P[hotos]." Today, Edgerton's legacy can be enjoyed in the sports section of any newspaper.

Edgerton also photographed animals in motion, including the family pet in *Jackie Wags His Tail* (1938) and *Jackie Jumps the Bench* (1938), which both show the successive phases of the dogs' movements in a single image. *Untitled (Man and Penguin)* of c. 1945 captures the bird in mid-stride, while *Untitled (Mrs. Webster with Hummingbirds)* of 1936, shot at one-hundredth of a second, freezes the fluttering wings of these hyperactive birds. This photograph is one of several taken by Edgerton to accompany the first of several articles on hummingbirds that appeared in *National Geographic.*

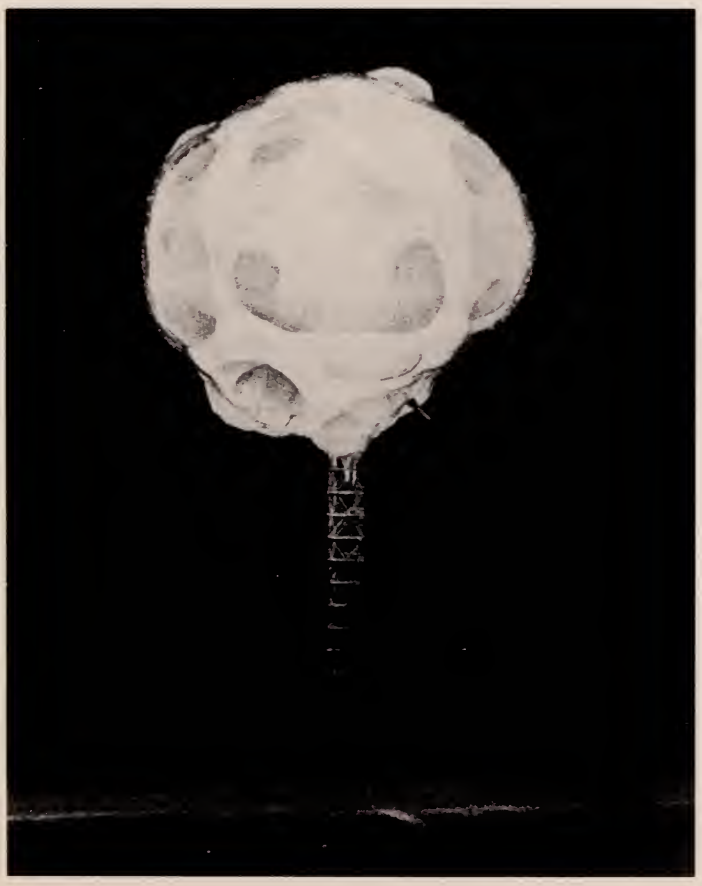
In 1940, as a result of the attention he received for his sports pictures, Edgerton and his assistants were invited to the MGM studios in Hollywood, where they met well-known host of specialty feature shorts Pete Smith, to collaborate on *Quicker Than a Wink*, an Oscar-winning film. At this time, Edgerton also conceived of a new way of making motion picture stills, shooting them while actors were performing, rather than, as had been customary, shooting posed stills later. This technique could capture, as in *Mickey Rooney and Judy Garland at MGM Studios* (1940), the emotional intensity of an actual performance as well as save time and money. Another example is *Fiedler at the Pops* (1947), where Edgerton used separate synchronized flashes for the conductor and the audience to obtain clarity for each.

During World War II, Edgerton was able to produce high-powered strobe lamps that made nighttime aerial photography possible and enabled Allied forces to keep track of enemy movements. A peacetime example of this technique is *Untitled (M.I.T. at Night —Aerial View)* of c. 1950. In 1947, Edgerton and his company also helped develop instrumentation for the Atomic Energy

Commission to test and photograph the early phases of nuclear explosions, which resulted in photographs such as *Explosion* (c. 1952).

Edgerton also turned his sights on the kitchens and backyards of American homes. These works tend to be stop-action photographs that focus on a single object or objects. A milk glass lying shattered on the floor (*Untitled [This Is Milk!]*, 1933), a sprinkler watering a lawn (*Sprinkler*, 1939), water streaming from a faucet (*Water onto a Can*, 1934), an aerosol can (*Untitled [Hairspray]*), and of course, the different versions of a drop of milk splashing into an already filled glass (the *Milk Drop* sequences of c. 1935 and *Cranberry Juice into Milk* of 1960).

The photographs of a bullet penetrating various objects and substances are among Edgerton's most striking images. The earliest of these photographs dates from the 1930s, including *Death of a Light Bulb* (c. 1936), and *Antique Gun Firing* (1936), and continued through the 1950s and 1960s with *Bullet Through Balloons* (1959), *Cutting the Card Quickly!* (1964), and *.30 Bullet Piercing an Apple* (1964). Like other photos by Edgerton, these allow us to see things beyond the range of ordinary perception. Yet the hint of violence underlying these works is somewhat at odds with the wholesome quality of Edgerton's other photographs.



Harold Edgerton, *Explosion*, c. 1952

Edgerton's studies of human and animal locomotion are in the tradition of nineteenth-century photographers, who were fascinated with the nature of movement, as Angela Kramer Murphy discusses in her essay. Edgerton's insistence that he's a scientist and not an artist is also in keeping with the spirit of his predecessors: "Don't make me out to be an artist," he said. "I am an engineer. I am after the facts. Only the facts."

Despite this denial, Edgerton's photographs continue the tradition of early twentieth-century artists who wanted to depict movement on a two-dimensional surface—a seemingly contradictory challenge. Many of Edgerton's multiflash photographs, such as *Jackie Wags His Tail*, and *Untitled (Violinist)* can be compared to paintings of the identical subjects by the Italian Futurist painter Giacomo Balla. For Balla and his contemporaries, movement and speed were the essence of modernity. The superimposed figure in Marcel Duchamp's *Nude Descending a Staircase* also comes to mind.

Edgerton's tightly framed views of ordinary things—a milk drop, or a stream of water, a shattered glass—have less in common with Duchamp and the Futurists than with the photographic work of Lázló Moholy-Nagy, the Hungarian-born theorist and artist who taught at the Bauhaus in the 1920s. By focusing closely on an object, shooting it from an odd point of view, and revealing things the eye cannot ordinarily perceive, Edgerton's photographs can make the familiar strange. This effect corresponds to Moholy-Nagy's concept of the "new vision," where the photographer's manipulation of the camera—radical cropping or light-dark contrasts, unorthodox angles—forces the viewer to see in unusual ways, thereby creating a new vision of the world.

Edgerton's stroboscopic photographs have greatly expanded our comprehension and knowledge of the world by revealing the mystery and wonder underlying the simplest actions and objects. Since Edgerton began to publish his photographs, pouring a glass of milk has never been the same.

ANGELA KRAMER MURPHY

The Paradox of Motion: Stopping Time Before the Stroboscope

Harold Edgerton's stroboscopic photographs capture events too fleeting for the human eye to perceive, too brief for the brain to apprehend. He catches a bullet as it pierces an apple, time stops, and motion becomes stillness. To create such dramatic photographs, Edgerton had the advantage of twentieth-century technology. Yet the quest to understand objects in motion predates the advent of modern photography and stroboscopic lighting. In fact, philosophers first grappled with the problem of motion several millennia before the invention of photography.

In the fifth century BC the Greek philosopher Zeno of Elea posed a series of four questions pertaining to motion. In one of his paradoxes, as they are known, Zeno argues that an arrow in flight is in fact at rest. At any given moment, the arrow occupies but one point in space, for it cannot be two places at once. In the next moment, it is farther along its path, and yet at any one instant it is at rest. One can imagine an Edgerton photograph of Zeno's arrow, suspended like the bullet in mid-air.

Harold Edgerton, *.30 Bullet Piercing an Apple*, 1964

Yet common sense suggests that of course the arrow, like Edgerton's bullet, is in motion. A projectile does not magically leap from one place to the next. The solution to Zeno's paradox lies in the realization that time and space are continuous. It is useless to speak of an arrow's position at a given moment, for a moment can be divided infinitely. An hour consists of minutes, minutes of seconds, seconds of milliseconds, and so forth. Zeno's arrow does not jump from one position to the next, from one moment to the next, but glides through an infinite number of positions and moments.[1]

The nineteenth-century invention of photography cast Zeno's paradoxes in a new light. Suddenly it was possible to stop Zeno's arrow and to study it in mid-air. In 1851, Henry Fox Talbot took the first "instantaneous" photographs, using an early form of electric flash to momentarily illuminate a clipping from the London Times attached to a spinning disk. Like Edgerton some eighty years later, Fox Talbot was able to stop time; in the photograph the newspaper appeared motionless. By the 1860s, improved technology permitted instantaneous photographs of city streets.[2] Upon observing a stereoscopic image of a bustling New York street scene, Oliver Wendell Holmes was puzzled by the awkward poses of pedestrians frozen in mid-stride and wondered:

> *Is motion but a succession of rests? All is still in this picture of universal movement. Take ten thousand instantaneous photographs of the great thoroughfare in a day; every one of them will be as still as the tableau in the "Enchanted Beauty." Yet the hurried day's life of Broadway will have been made up of just such stillnesses. Motion is as rigid as marble, if you only take a wink's worth of it at a time.*[3]

Holmes' fascination with instantaneous photographs exemplifies the nineteenth-century preoccupation with the study of motion. One question in particular troubled artists and scientists alike: do all four legs of a galloping horse ever leave the ground at the same time? The issue was widely debated—some found the very notion of "unsupported transit" absurd, while others swore they had seen a horse momentarily suspended in mid-air.[4] Despite several attempts to study horses in motion, the question remained unresolved. In the 1860s, the French physiologist Étienne-Jules Marey constructed an elaborate device affixed to a horse's shoe that would record the moment each hoof struck the ground.[5] The artist Jean-Louis-Ernest Meissonier was so eager to paint accurate battle scenes that he built a miniature railway alongside a racetrack so that he could follow a horse in motion, but the animal's swift movements still eluded him:

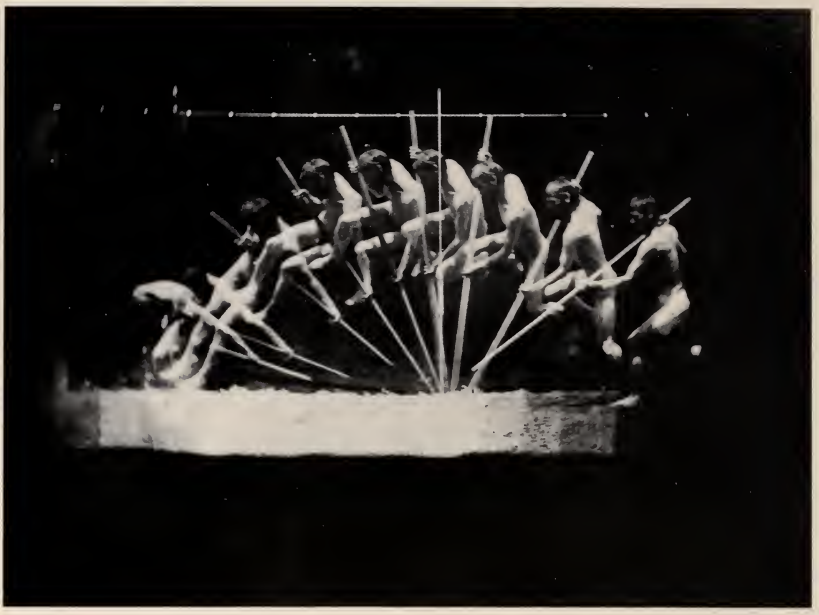
Copyright, 1878, by MUYBRIDGE.
MORSE'S Gallery, 417 Montgomery St., San Francisco.
THE HORSE IN MOTION.
Illustrated by
MUYBRIDGE.
AUTOMATIC ELECTRO-PHOTOGRAPH
"ABE EDGINGTON," owned by LELAND STANFORD; driven by C. MARVIN, trotting at a 2:24 gait over the Palo Alto track, 15th June 1878.

Eadweard Muybridge, *The Horse in Motion*, 1878

> *I managed at last, by dint of sheer hard work, to thoroughly understand a horse's walk (which is a very difficult matter), and its trot, which is easier. But my studies of the gallop, though I watched it with all the attention I could bestow, never satisfied me. I had even broken down one horse, all to no purpose.*[6]

In the early 1870s, former California governor Leland Stanford became interested in the question of animal locomotion. According to legend, Stanford placed a wager in favor of the theory of "unsupported transit." Although the story of a bet may be apocryphal, Stanford did set out to settle the debate. At first he simply tried to study a horse's hoof prints. Then he had an idea: couldn't an instantaneous photograph of a horse reveal whether or not all four legs ever left the ground? In 1872, Stanford sent a telegraph to the respected landscape photographer Eadweard Muybridge seeking his assistance in the project. Muybridge later recalled that he was "perfectly amazed at the boldness and originality of the proposition."[7]

Muybridge initially wondered if Stanford's plan was feasible; capturing a galloping horse would be far more difficult than photographing pedestrians on the street. Yet he eventually produced blurred images that he claimed "were sufficiently sharp to give a recognizable silhouette portrait of the driver, and some of them exhibited the horse with all four of his feet clearly lifted, at the same time, above the surface of the ground."[8] Although Muybridge's first fuzzy photographs suggested that Stanford had been right, a few skeptics questioned their accuracy. Even those who accepted the notion of "unsupported transit" had expected to see the traditional "hobby horse" position, with the animal's legs spread out, not tucked awkwardly underneath its body as they

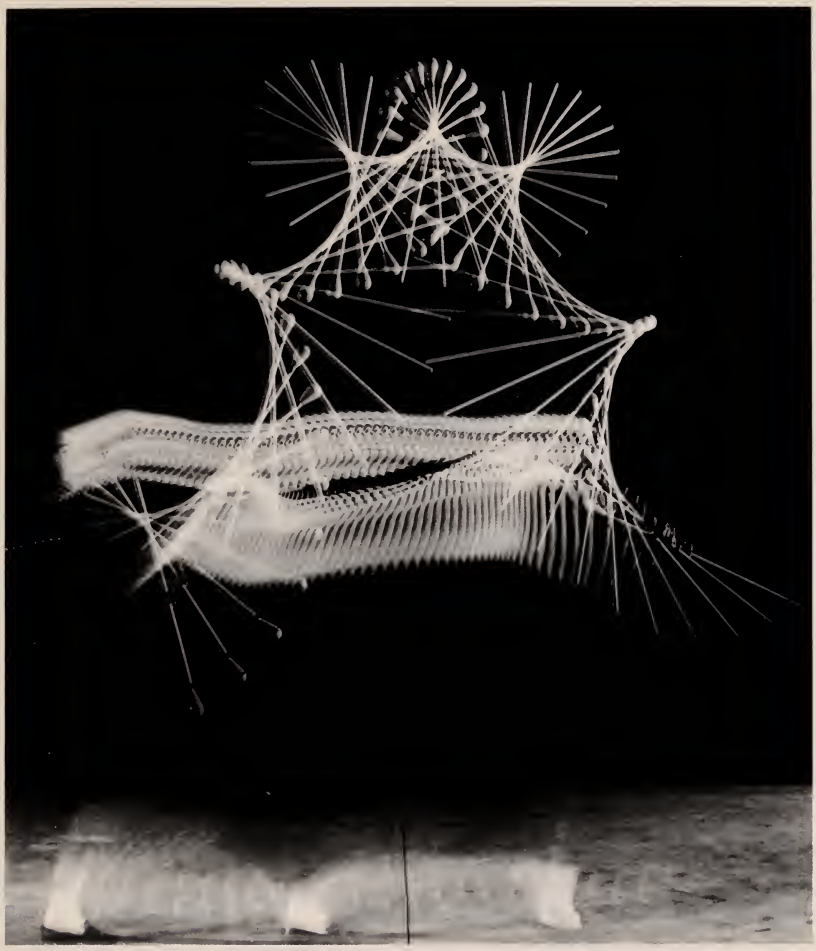


Thomas Eakins, *Pole Vault*, c. 1885

were in the Muybridge photographs.[9] The San Francisco *Evening Post* complained, "Either the camera did lie or Stanford has got the most extraordinary horse in the world."[10]

As Stanford and Muybridge continued their experiments, they were no longer merely interested in settling a wager. Instead, they set out to make a complete photographic study of animal locomotion. In order to analyze a horse's movements in sequence, Muybridge devised a system for taking multiple photographs. On one side of the track he set up twelve cameras at even intervals; on the opposite side he placed a white backdrop calibrated with vertical lines 21 inches apart. With the assistance of a team of engineers, Muybridge developed an electrical triggering mechanism that would open each camera's shutter for approximately 1/2000th of a second when the horse tripped a wire stretched across the track. In June 1878, Muybridge invited interested sportsmen and journalists to Stanford's Palo Alto farm to witness his photographs of the horse Abe Edgington.[11] Later that year, he published a series of six photograph cards entitled *The Horse in Motion.* The text on the back of one card notes that the horse is "literally flying in mid-air."[12]

The publication of Muybridge's photographs created a sensation both at home and abroad. In France, the physiologist Marey immediately saw in Muybridge's photographs a tool to continue his own research into animal locomotion. However, instead of taking a series of photographs from different perspectives, Marey invented a camera that could take multiple exposures from a single perspective. A revolving disk placed in front of the lens acted as an intermittent shutter, permitting light to enter the camera at timed



Harold Edgerton, *Drum Majorette*, 1953

intervals. The "Marey-wheel" camera thus made several exposures on a single plate of film. The American artist Thomas Eakins constructed a version of the Marey-wheel camera, which he used to photograph and analyze the movements of students and athletes walking, running, leaping, and even pole-vaulting.[13]

Whereas Muybridge's photographs require the viewer to compare one image to the next—to move abruptly from moment to moment, position to position—Marey-wheel photographs suggest the seamless flow of movement in time and space. Years later, Edgerton would adopt Marey's strategy, but instead of using a revolving wheel to create multiple exposures, he would use stroboscopic light to capture the intricate dance of a drum majorette. In fact, Edgerton thought little of Muybridge, and once remarked, "Anyone can do that. That's easy. What I do isn't easy."[14]

Nevertheless, Edgerton's work remains indebted to the pioneering experiments of his nineteenth-century predecessors, including Fox Talbot, Muybridge, Marey, and Eakins. Their photographs revealed that certain movements, such as a horse's swift gait or the graceful arc of a pole-vaulter, are simply too quick and

too complex for the unaided human eye to perceive. As Oliver Wendell Holmes noted, even the much slower movements of a man walking down the street can fool the eye. Yet why is the eye so easily deceived? Why did so many questions about motion remain unanswered until the advent of photography? The difficulty, Muybridge realized, is that the eye does not simply see, but must make sense of what it sees, relying on learned expectations that are often misleading:

> *If it is impressed on our minds in infancy that a certain arbitrary symbol indicates an existing fact; if this same association of emblem and reality is reiterated at the preparatory school, insisted upon at college, and pronounced correct at the university; symbol and fact — or supposed fact — become so intimately blended that it is extremely difficult to disassociate them, even when reason and personal observation teaches us that they have no true relationship.*[15]

The solution to Zeno's paradox, it seems, lies not merely in the realization that time and space are continuous, but in the admission that human perception is limited. We learn to conceptualize motion as a series of independent steps; time as a series of discrete moments; space as a neatly divided grid. Our minds operate like a Muybridge photograph — we find it difficult to understand motion without stopping time to study it.

1. Bertrand Russell, "The Problem of Infinity Considered Historically," in Wesley C. Salmon, ed., *Zeno's Paradoxes* (Indianapolis: Bobbs-Merrill Company, 1970), pp. 50-51.

2. Beaumont Newhall, *The History of Photography from 1839 to the Present Day* (New York: The Museum of Modern Art, 1949), p. 103.

3. Oliver Wendell Holmes, "Sun-Painting and Sun-Sculpture," *The Atlantic Monthly*, 8 (July 1861), p. 18.

4. James L. Sheldon, "A Man Beyond His Time," in James L. Sheldon and Jock Reynolds, *Motion and Document — Sequence and Time: Eadweard Muybridge and Contemporary American Photography*, exh. cat. (Andover, Massachusetts: Addison Gallery of American Art, Phillips Academy, 1991), p. 9.

5. Françoise Forster-Hahn, "Marey, Muybridge and Meissonier: The Study of Movement in Science and Art," in Anita Ventura Mozley, *Eadweard Muybridge: The Stanford Years*, 1872-1882, exh. cat. (Stanford, California: Stanford University Museum of Art, 1972), pp. 86-89.

6. Forster-Hahn, ibid., p. 91.

7. Muybridge, in Robert Bartlett Haas, "Eadweard Muybridge, 1830-1904," in Mozley, *Eadweard Muybridge: The Stanford Years*, p. 14.

8. Muybridge, ibid., p. 18.

9. Forster-Hahn, "Marey, Muybridge and Meissonier," p. 85.

10. San Francisco *Evening Post*, September 1877, in Haas, "Eadweard Muybridge," p. 18.

11. Ibid., pp. 21-22.

12. Muybridge, *The Horse in Motion*, in Mozley, *Eadweard Muybridge: The Stanford Years*, p. 68.

13. Lloyd Goodrich, *Thomas Eakins* (Washington, D.C., National Gallery of Art, 1982; Cambridge, Massachusetts: Harvard University Press, 1982), pp. 268-75.

14. Quoted in Estelle Jussim, *Stopping Time: The Photographs of Harold Edgerton* (New York: Harry N. Abrams, 1987), p. 22.

15. Muybridge, quoted in Forster-Hahn, "Marey, Muybridge and Meissonier," p. 105.

Works in the Exhibition

All works are from the Permanent Collection of the Whitney Museum of American Art; Gift of The Harold and Esther Edgerton Family Foundation. Dimensions are in inches; height precedes width.

Harold Edgerton (1903-1990)

Glassy Immobility, 1932
Gelatin silver print, 19 7/8 x 16
96.117.96

Untitled (This Is Milk!), 1933
Gelatin silver print, 16 x 19 7/8
96.117.89

Flight of a Dove, 1934
Gelatin silver print, 23 7/8 x 20 1/16
96.117.78

Water onto a Can, 1934
Gelatin silver print, 14 x 10 15/16
96.117.98

Iron, Golf, 1935
Gelatin silver print, 11 x 13 15/16
96.117.44

Untitled (Milk Drop 1), c. 1935
Gelatin silver print, 13 15/16 x 10 15/16
96.117.60

Untitled (Milk Drop 2), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.61

Untitled (Milk Drop 3), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.62

Untitled (Milk Drop 4), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.63

Untitled (Milk Drop 6), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.64

Untitled (Milk Drop 7), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.65

Untitled (Milk Drop 9), c. 1935
Gelatin silver print, 14 x 10 15/16
96.117.66

Lead Shot from a Shot Tower, 1936
Gelatin silver print, 10 x 8 1/8
96.117.52

Untitled (Mrs. Webster with Hummingbirds), 1936
Gelatin silver print, 14 x 10 15/16
96.117.73

Death of a Light Bulb, c. 1936
Gelatin silver print, 19 15/16 x 23 7/8
96.117.26

Bent Bat Bumps Ball, 1938
Gelatin silver print, 14 x 10 15/16
96.117.81

Charles Hare Serves, 1938
Gelatin silver print, 13 15/16 x 10 15/16
96.117.21

Dennie Shute, 1938
Gelatin silver print mounted on paperboard, 14 3/4 x 15 7/8
96.117.27

Football Kick, 1938
Dye transfer print, 20 x 16
96.126.1

Jackie Jumps the Bench, 1938
Gelatin silver print, 12 x 18
96.117.46

Jackie Wags His Tail, 1938
Gelatin silver print, 13 15/16 x 10 15/16
96.117.47

A Simple Salute, 1938
Gelatin silver print, 20 x 15 7/8
96.117.34

Two Fencers, 1938
Gelatin silver print, 9 7/8 x 15 15/16
96.117.92

Untitled (Squash), 1938
Gelatin silver print, 8 1/8 x 10
96.117.83

Untitled (Woman Jumping over Stool at MGM Studios), 1938
Gelatin silver print, 13 15/16 x 11
96.117.101

Indian Club Demonstration, 1939
Gelatin silver print, 19 7/8 x 23 7/8
96.117.41

Indian Club Demonstration, 1939
Gelatin silver print, 14 x 10 15/16
96.117.42

Sprinkler, 1939
Gelatin silver print, 15 15/16 x 19 13/16
96.117.99

Swirls and Eddies, 1939
Gelatin silver print, 16 x 19 7/8
96.117.84

Diver Peter DesJardin, 1940
Gelatin silver print, 23 7/8 x 20
96.117.30

Home Brew, 1940
Gelatin silver print, 23 7/8 x 20
96.117.39

Jumping Girl, 1940
Dye transfer print, 20 x 15 1/8
96.117.57

Mickey Rooney and Judy Garland at MGM Studios, 1940
Chromogenic print, 15 7/8 x 19 13/16
96.117.58

Untitled (Backdive and Observer), c. 1940
Gelatin silver print, 11 x 13 15/16
96.117.3

Untitled (Bullet Emerging from Pistol), c. 1940
Gelatin silver print, 16 x 19 7/8
96.117.9

Untitled (Golfer), c. 1940
Gelatin silver print, 13 15/16 x 10 15/16
96.117.36

Untitled (Gyroscope), c. 1940
Gelatin silver print, 8 x 10 1/8
96.117.37

Untitled (Hummingbird), c. 1940
Chromogenic print, 11 x 14
96.117.40

Untitled (Irish Woman Hitting Punching Bag), c. 1940
Gelatin silver print, 13 15/16 x 10 15/16
96.117.43

Untitled (Man and Penguin), c. 1945
Gelatin silver print, 13 7/8 x 11
96.117.53

Fiedler at the Pops, 1947
Dye transfer print, 20 1/2 x 15 3/8
96.117.33

The Great Dome, c. 1950
Gelatin silver print, 8 5/8 x 11 1/16
96.117.68

Untitled (M.I.T. at Night—Aerial View), c. 1950
Gelatin silver print, 19 15/16 x 16
96.117.67

Moving Skip Rope, 1952
Gelatin silver print, 20 1/16 x 23 7/8
96.117.71

Drum Majorette, 1953
Gelatin silver print, 14 x 10 15/16
96.117.5

Diver, 1955
Dye transfer print, 20 1/8 x 16 1/16
96.126.2

High-Speed Particles, 1956
Gelatin silver print, 16 7/8 x 12 1/8
96.117.31

Milk Drop Coronet, 1957
Dye transfer print, 19 15/16 x 16
96.126.3

Bullet Through Balloons, 1959
Gelatin silver print, 16 x 19 7/8
96.117.14

Cranberry Juice into Milk, 1960
Dye transfer print, 20 1/8 x 16 1/8
96.126.4

Bullet Smashes Plexiglas, 1962
Gelatin silver print, 19 15/16 x 16 1/16
96.117.16

Moscow Circus, 1963
Dye transfer print, 16 1/16 x 20
96.126.5

Untitled (Moscow Circus), 1963
Chromogenic print, 8 x 10
96.117.70

Bullet Through Banana, 1964
Dye transfer print, 16 x 19 15/16
96.126.6

Cutting the Card Quickly!, 1964
Dye transfer print, 16 1/8 x 20 1/16
96.126.8

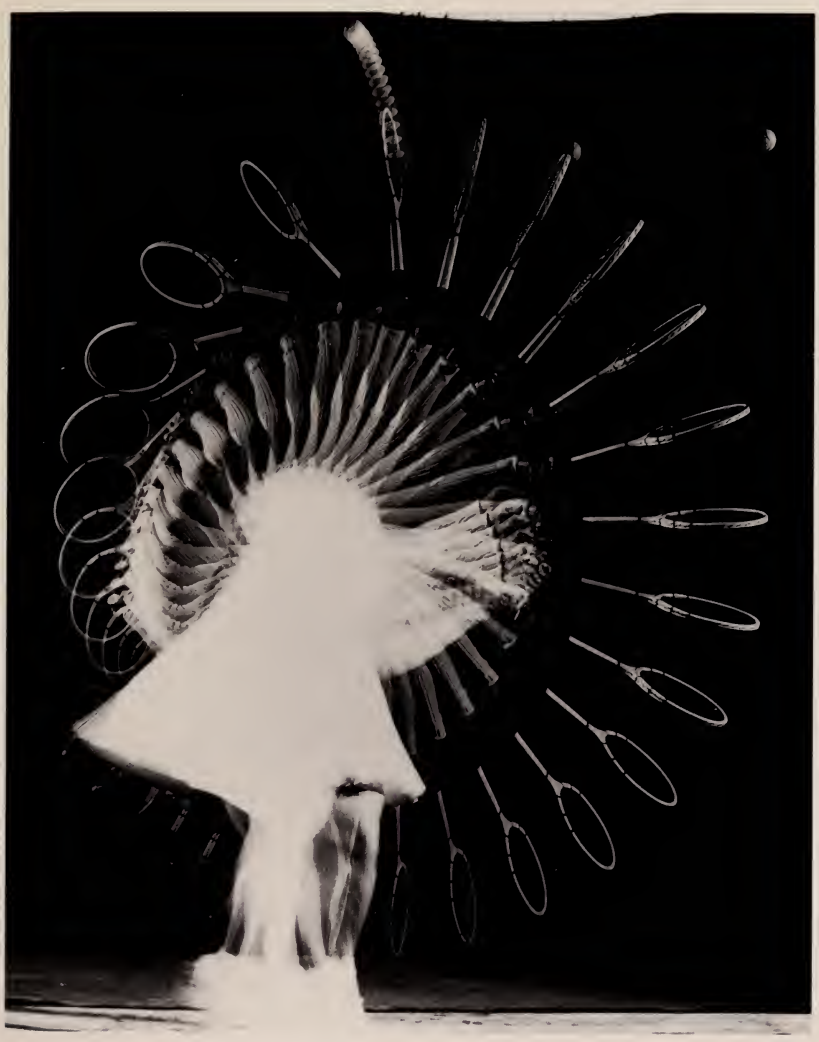
.30 Bullet Piercing an Apple, 1964
Dye transfer print, 15 15/16 x 19 15/16
96.126.7

Untitled (Pole Vaulting), c. 1964
Gelatin silver print, 10 x 8 1/8
96.117.76

Pigeon Released, 1965
Dye transfer print, 16 1/16 x 20 1/16
96.126.9

Untitled (Owl), 1965
Gelatin silver print, 11 x 13 7/8
96.117.74

Shock Waves Revealed, 1970
Gelatin silver print, 10 15/16 x 13 15/16
96.117.12



Harold Edgerton, *Untitled (Tennis serve)*, n.d.

Untitled (Sequenced Drop), 1986
Gelatin silver print, 8 x 10
96.117.79

Ten Photographs, 1992
Silver gelatin print, dimensions variable
96.125.1-10

Untitled (Bubble), n.d.
Chromogenic print, 14 x 11
96.117.8

Untitled (Bullet Through Helium Bubble), n.d.
Gelatin silver print, 23 7/8 x 20
96.117.15

Untitled (Cello), n.d.
Gelatin silver print, 4 x 5 1/16
96.117.94

Untitled (Hairspray), n.d.
Gelatin silver print, 8 9/16 x 11
96.117.38

Untitled (Kangaroo Toy), n.d.
Gelatin silver print, 11 x 13 15/16
96.117.50

Untitled (Man and Violin), n.d.
Gelatin silver print, 4 x 5
96.117.54

Untitled (M.I.T. World's Fair Exhibit), n.d.
Gelatin silver print, 10 15/16 x 13 15/16
96.117.69

Untitled (Parrots), n.d.
Chromogenic print, 10 15/16 x 14
96.117.75

Untitled (Tennis Serve), n.d
Gelatin silver print, 13 15/16 x 11
96.117.85

Untitled (Violinist), n.d.
Gelatin silver print, 4 x 4 15/16
96.117.95

Whitney Museum of American Art
at Philip Morris
Park Avenue at 42nd Street
New York, New York 10017

Gallery Hours
Monday–Friday, 11:00 am–6:00 pm
Thursday, 11:00 am–7:30 pm

Sculpture Court Hours
Monday–Saturday,
7:30 am–9:30 pm
Sunday, 11:00 am–7:30 pm

Gallery Talks
Monday and Friday at 1:00 pm

Free admission
Tours by appointment
For more information,
call (212) 878-2453

Staff
Thelma Golden
Associate Curator,
Branch Director

Jeanette Vuocolo
Manager

Shamim Momin
Gallery Assistant,
Exhibition Programs

Allison Smith
Senior Gallery Assistant,
Education Programs

Jeffrey B. Hopkins
Gallery Assistant,
Operations

Cover:
Harold Edgerton, *Milk Drop Coronet*, 1957

Inside front and back cover:
Harold Edgerton, *Glassy Immobility*, 1932

Design: Bethany Johns Design
Printing: Meridian Printing
Paper: Champion Kromekote®
Photograph credits: Geoffrey Clements